CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

CONFIDENTIAL

[redacted]

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1. MVD Installation No. 14 on Leningrad shosse in Moscow was concerned with the development of radio control equipment.[1] The institute was founded after the war and was housed in a five-story building, about 125 meters long, with a wing attached to each of its ends. The building was erected in several stages between 1947 and 1951. (See sketches 1 and 2 on pages 7 and 8.)

2. The German specialists working at the institute lived in a camp near the village of Mashkino, southwest of the intersection of the highway and the railroad line running from Moscow to Leningrad. In 1947, the Germans were assigned offices on the fifth floor in the southern portion of the building. Later, these rooms were exclusively used by the group of experts working on transmitters, while the other German organizations moved to rooms on the second floor, also in the southern portion of the building. The rooms used were furnished either with writing desks for two to six men or with laboratory desks. Each of the rooms was fitted with a panel designed for various voltages. Voltages available included 3 x 220-volt three-phase current, alternating current of 400 c.p.s., 110 to 120-volt, and 24-volt d.c. The considerable dropping of the voltage at specific times indicated that the current was furnished by the municipal power system. 25X1

3. In the fall of 1950, five rooms on the second floor were established as a separate unit by the erection of a door in the corridor. These rooms were off-limits to all unauthorized personnel. they 25X1

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were assigned to another German organization, because the interpreter was often seen there and [redacted] in one of the buses of the installation, a German high-frequency engineer who had previously worked at the Siemens firm in Berlin. 25X1

4. Two single-story workshops were attached to the rear side of the installation. One of them was used by the Germans. The workshop was equipped with 40 to 50 lathes, in addition to other machinery. When, in 1950, this workshop was converted into a mess hall, the machinery was probably moved to one of the workshops attached to the back of the neighboring building at the circular place (see sketch on page 7). Nevertheless, the work previously conducted in the old workshop was not interrupted. There was heavy traffic between Installation No. 14 and these workshops. The institute had no foundry of its own. Many component parts observed at the installation consisted of light metal. The construction of some of them indicated that production of equipment involving the utilization of die-castings had been planned. However, these plans were abandoned.

5. The Germans and Soviets at the institute worked isolated from each other. [redacted] A radar set similar to the Wuerzburg-Riese seen on the roof in the northern section of the building indicated that the Soviets also studied DF problems. At first, the Soviet personnel took their meals in a club located on the south side of the highway to Tushino. Later, a mess hall with a capacity for about 1,000 persons was established in the area of the institute. 25X1

6. The German experts working at MVD Installation No. 14 were assigned the mission of developing a remote-control set operating on a three-centimeter wave length. The project was given the code designation Komet (see sketch 3 on page 10), with suffix figures 1, 2, and 3 indicating slightly different development stages of the project. The equipment was designed to direct a missile released by a mother plane to its target. It was planned to install a guide-beam transmitter in the aircraft carrying the missile and then make the missile move to a point in the vicinity of the target along the guide beam. Shortly before the target was reached, a target-seeking radio receiver fitted in the head of the missile was to be activated by the impulses reflected from the target, and then take over the directing of the missile to its target. The Soviets expected the missile to develop a speed of 900 km per hour and to be capable of a maximum range of 120 km. The device was obviously designed to be employed against ships. At any rate, the problem was discussed how the missile would react if and when it should come under the influence of two targets. The idea of the whole device was, allegedly, first conceived and discussed by Sergey Beriya (see personalties on pages [illegible] and 6).

7. Source learned that other procedures for directing missiles released from aircraft to their targets were also discussed. Mention was made in this connection of an image converter to be fitted in the head of the missile, which was to be remote-controlled in accordance with the television picture transmitted. Before the development work was started, the utilization of the 10-centimeter wave length was discussed; later, the feasibility of one-centimeter wave length was taken into consideration.

8. According to source, the main contribution of the German experts at the installation was the demonstration given to the Soviets as to how German engineers would organize a research institute and how they would handle the development of a complicated technical device. The device actually developed was believed to be obsolete [redacted] However, the Soviets had a chance to experiment with the device, to find out its weak points, and to improve it. 25X1

9. The institute was frequently visited by top-level Soviets. [redacted] Voroshilov, MVD chief Beriya, and Bulganin, who spoke good German and who stated that the German engineers were the most valuable war prize the Soviets had secured. Naval officers frequently came to the institute, while air force officers were seen there only occasionally. Junior army officers who stayed for prolonged periods at the institute were [redacted] to be test personnel who wanted to familiarize themselves with the working and missions of the equipment. They attended all experiments made at the institute. 25X1 25X1 25X1

10. At first the Soviets did not appear to be greatly interested in the development of the transmitter for the project. They told the German engineers that they had already developed the transmitter required. However, after some time, the group headed by Baier was ordered to develop a guide beam transmitter. By early 1951, the development of the component parts of the transmitter had been completed, but the development of the transmitter itself was delayed by undetermined difficulties. The antenna to be used was a parabolic reflector, about 160 centimeters high, fitted with an eccentrically rotating dipole, and, allegedly, stabilized by gyroscopes. The antenna was designed to be mounted on an aircraft, apparently of the B 29 type, but faster. It was to be oriented toward the target, no matter in what position the aircraft was. The German engineers had no idea how the Soviets would manage to mount an antenna of that size and the pertinent follow-up control device on a plane. A follow-up control device fitted with servo motors was developed in the design bureau. For some time, Soviet engineer Sergey Lysitsyn worked on the development of the antenna. 25X1

11. From the very beginning, the Soviets pushed the development of the receiver and the remote control unit for the missile. Besides one experimental set built in the laboratory, a total of 12 units were built by early 1951. The chassis required for the unit had been cast from light metal at some other place. In late 1948, a report on the development work completed so far was drawn up, and photographs of the prototype plant were taken. Subsequently, the individual members of the group had to report in detail to a large group of Soviet experts on the component parts of the whole set developed by them. On this occasion, the remote control units built in the laboratory were displayed alongside prototypes developed at other installations. [redacted] the relative merits of the various devices developed by different groups of development engineers were to be compared. After the end of the conference, it was announced that the German organization working at MVD Installation No. 14 had done well. The consequence was that all equipment required for the continuation of the development work was speedily procured, while prior to that date there had been great difficulties in this field. A special procurement office was set up and all the requests for technical equipment made by the German engineers were compiled with without delay. A well-stocked depot of technical equipment was established on the ground floor and in the basement. 25X1 25X1

12. For their development work the Germans used a mock-up model of the fuselage of the missile. In its middle section the fuselage had a diameter of about 120 centimeters. The two receivers were installed in a joint case fitted in the head of the missile. They took up a space of about 1.2 x 0.8 x 0.8 meters. The individual components of the receivers could be inserted into the case from the side. The head and the rear of the missile housed one antenna each, protected by plexiglass. The antennas were parabolic reflectors having a diameter of 30 to 35 centimeters; they were fitted with a receiving dipole which rotated synchronously with the transmitting dipole, which made 30 to 75 revolutions per second. The line extending to the rear antenna was designed as a hollow pipe wave guide with a maximum length of eight meters. Until shortly prior to reaching the target, the first receiver of the missile, which, with its rear antenna, directly received the guide beam transmitted by the mother plane, was tuned to the remote control plant of the mother plane. Only after the signals reflected by the target and received by the front antenna had reached a certain strength was the control automatically switched over to the second receiver.

13. The pulse duration was shorter than one microsecond. The impulse period and form were measured by means of improvised oscillographs, which were far better suited for this kind of work than the type 248 oscillographs of the firm of Dupont, which were also available at the institute. The oscillograph developed at the institute was later manufactured in quantity. An important component part of the plant was that designed for impulse coding, which was rather difficult to incorporate into the transmitter plant. The pulse recurrence frequencies were controlled by a crystal resonator. In the receiver plant, a simplified method of impulse selection was finally utilized. When tests were made with a signal generator fitted with a klystron tube, the impulse selection unit proved to be surprisingly insensitive to disturbances. Even powerful jammers had no effect whatsoever. In the input stage, the detector was protected by a peak chopper against powerful interfering impulses. 25X1 25X1

14. The control devices developed by Fischer were very efficient. The output voltage of the receiver was first increased in a magnetic amplifier and then fed into a very small integration motor fitted with permanent magnets. This motor, which was about five centimeters long and 3.5 centimeters in diameter, had a considerable starting torque. According to German conceptions, the demands laid down for the accuracy and the response time of the drive mechanisms were exaggerated. They were to have a moment of force of 20 mkg.

15. After 1949, the institute had no difficulties whatsoever as to the supply of materials and technical equipment. In particualr, there was an ample supply of measuring sets of the highest quality. [redacted] Prior to 1950, most of the measuring sets used were of American origin. After that date, the Soviets switched over [redacted] The Frunze plant furnished three-centimeter measuring sets. Good indicating instruments were delivered by plants in Frunze and Minsk. On a Soviet indicator, 50 centimeters square, it was stated that the set had an accuracy of 0.1 percent. This proved to be correct. There was an ample supply of luminous indicators with a sensitiveness of one and three micro-amperes at full deflection. The luminous indicators were Soviet copies of equipment developed by the Siemens firm. The firm of Goerz in Vienna delivered wattmeters with an accuracy of 1 percent. The firm of Zierold, which has probably been taken over by the Czechs, also furnished valuable instruments. 25X1 25X1

16. A Soviet engineer made laboratory tests with printed circuits. He was investigating the structure of the receiver plant utilizing such circuits. However, he did not make any experiments, because the component parts required for such receiver plants were to be manufactured in Leningrad. 25X1

17. Soviet students also worked at the laboratories [redacted] in the composition of their theses for their engineer diplomas. American, British, and German technical literature was available at the Institute. All volumes of the Radar System Engineering publication of the Massachusetts Institute of Technology were also on hand, either in the original or as photostats.

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List of Leading Personnel at Installation

18. The installation was under the control of Sergey Beriya. Its technical manager was Professor Kuksenko. Soviet liaison officer with the group of German engineers was Captain Panfilov. Senior Lieutenant Solovyev was temporarily attached to the institute.

The group of German experts included 47 high-frequency engineers and three mathematicians. Thirty of them were assigned to the group working on the development of receiver plants. In late 1950, the Germans were asked to sign contracts for another five years in the USSR. Fourteen of the Germans who refused were transferred to Ilinskaya, from where Dr. Klaiber and Dominik were repatriated in December 1953. 25X1 25X1

a. Group of German experts working on the development of receiver plants.

Chief: Otto Schmidt, who was replaced by mathematician Schallmeister when Schmidt was imprisoned by the Soviets. 25X1

Deputy chief: Sorge (fnu).

The group comprised the following departments: 25X1

Department	Assigned
Antenna unit	Sergey Lysitsyn.
HF unit	Seemann (fnu) [redacted]
Intermediate frequency unit	Strauss (fnu), jointly with a well-qualified Soviet. 25X1
Impulse selection	Dominik, jointly with a Soviet called Bruitgalt.
Phase rectifier	Dr. Klaiber (fnu), a physicist [redacted]
Receiver for direct reception (rear antenna)	Sorge (fnu) [redacted]
Current supply and synchronous unit	Goldberg (fnu) [redacted] 25X1

b. Group of experts working on the development of transmitters:

Chief: Baier (fnu), [redacted] 25X1

Department	
Magnetron unit	Grosse (fnu), [redacted], assisted by Kranich (fnu). 25X1
Impulse unit	Otto Schmidt.
Power supply unit and high-tension unit	Berner (fnu), [redacted] 25X1
Antenna unit	Geissmann (fnu), only for a short time.

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c. Group of experts working on the development of the remote-control mechanism.

Chief: Golecki (fnu) [redacted] Golecki 25X1
was assisted by Dr. Fischer (fnu), [redacted] and one 25X1
Kuhfeld (fnu), [redacted] Of the Soviet engineers attached to the 25X1
the department, two were very efficient; one of them was an expert in the field of aerodynamics.

d. Group of mathematicians:

Hielscher (fnu), [redacted] 25X1
Professor Stein (fnu).
Schallmeister (fnu).

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Soviet Personnel Attached to MVD Installation No. 14

Sergey Beriya: Son of former MVD chief Beriya. [redacted] 25X1

Romanov: [redacted] 25X1

Bruitgalt: He worked alongside Dominik, an expert in the field of high 25X1
frequency techniques. [redacted] 25X1

Sergey Lysitsyn: He worked for a short time with the group of German experts charged with the development of the transmitter plants. He [redacted]

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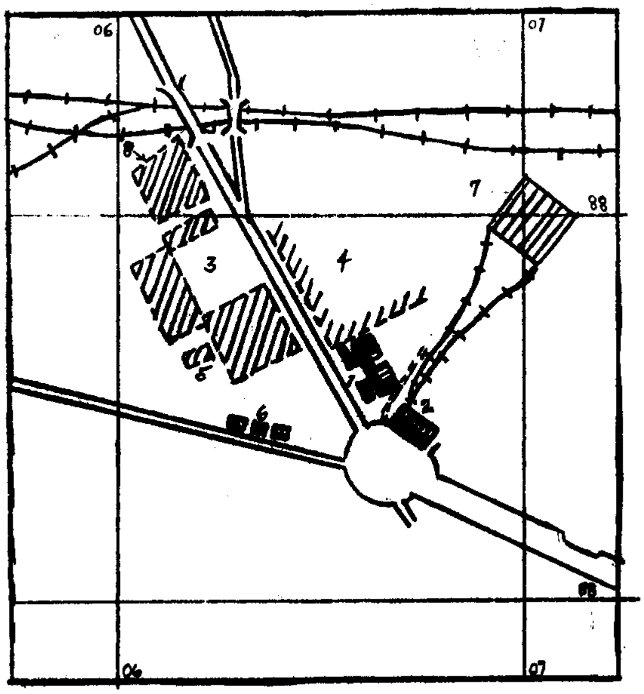
1. [redacted] Comment. The MVD Installation No. 14, Leningrad shosse, referred 25X1
to in this report is possibly OKB No. 2, which is located on 228 Leningrad shosse, Moscow.

2. [redacted] Comment. The institute referred to in No. 3 of the legend on page 25X1
7 is possibly the Experimental Works of the Moscow Institute of Aviation (MAI).

Sketch No. 1

Location Sketch of MVD Installation No. 14



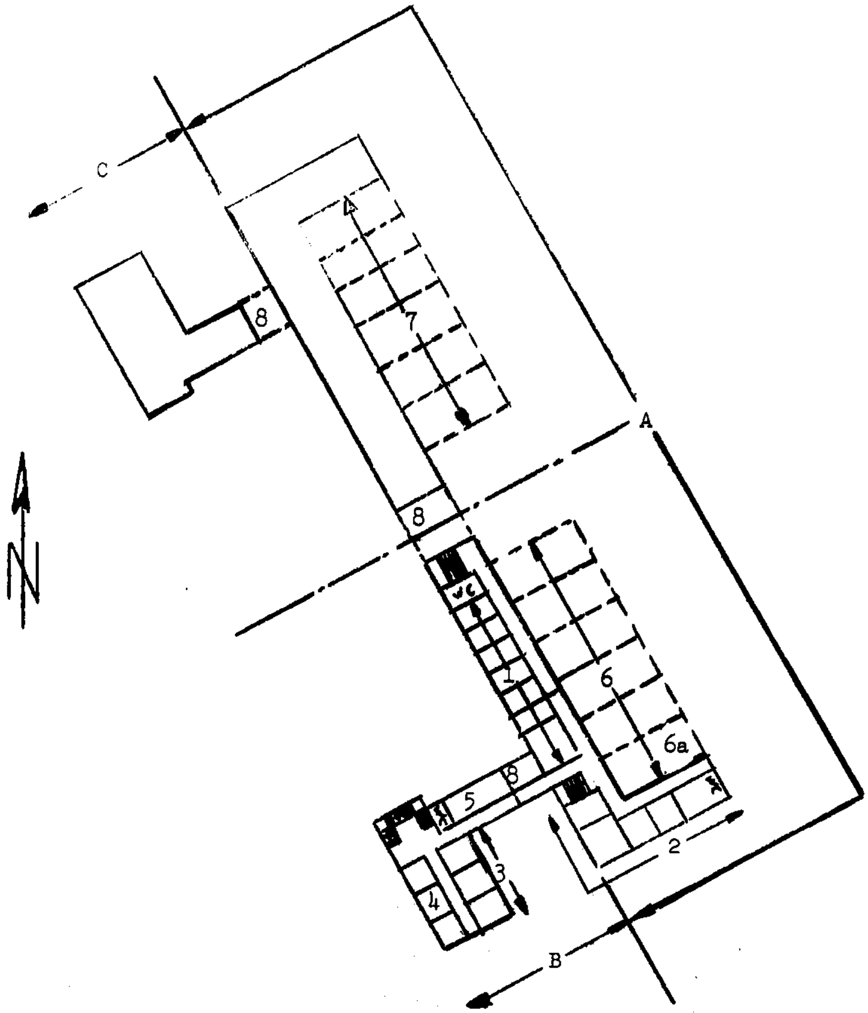
Scale 1: 12,500

Legend

1. MVD Installation No. 14.
2. Large building erected between 1949 and 1951 to fill the last remaining gap of a circular place; the building appeared to belong to the institute.
3. Avio Institute, still partly in process of reconstruction.[2]
4. Terminal facilities for streetcars.
5. Old workshop equipped with an engine test stand.
6. Old buildings.
7. Side tracks for rolling stock of the underground railway system.
8. Old foundry.

Sketch No. 2

Layout Sketch of Institute Building of [illegible] , . Special Object No. 14



Scale about 1:1000

Legend

A. Main section of building, completed in 1947.

B and C. Wings built in 1949.

Setup of rooms on the first floor, southern section of the building:

1. Rooms initially assigned to the Germans; in the fall of 1950 the five northern rooms were separated from the remainder of the offices.

2 and 3. Rooms later allocated to the Germans.

4. Storage of classified material.

5. Library.

6. Workshop with glassed shed roof, used by the Germans.

6a. Workshop control office, converted to a mess hall in 1950.

7. Workshop with glassed shed roof, used by the Soviets.

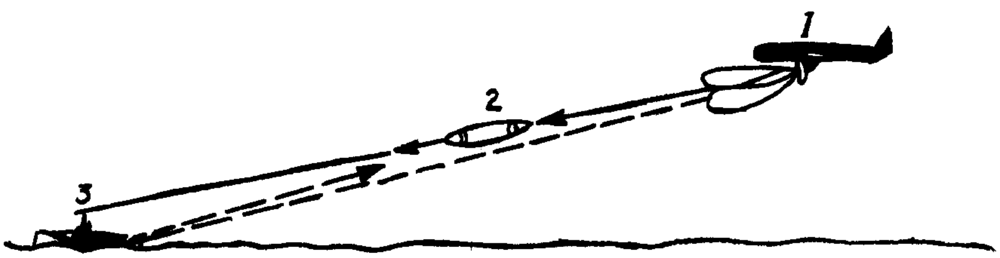
8. Doorway.

The basement housed kitchens and mess rooms besides, presumably, transformer plants and storage facilities for technical equipment.

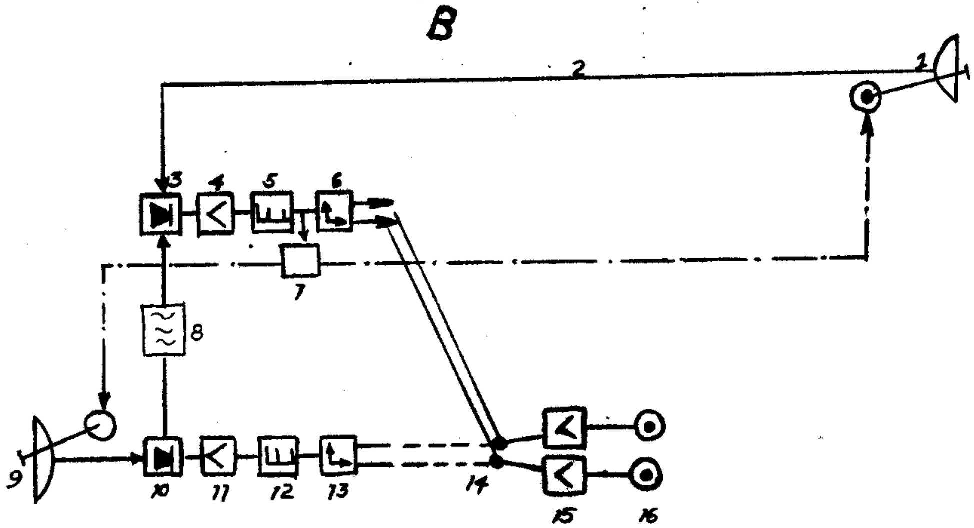
Sketch No. 3.

Working System and Switching Diagram of the Komet Set

A



B



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Legend

A. Schematic representation of the working system of the Komet set.

1. Mother plane with guide beam transmitter.
2. Missile.
3. Target.

B. Block Diagram of Komet Set.

1. Rear antenna,with synchronous drive mechanism.
2. Hollow pipe wave guide.
3. Mixer.
4. Intermediate frequency amplifier.
5. Impulse selection.
6. Phase rectifier.
7. Synchronous unit.
8. Oscillator.
9. Front antenna,with synchronous drive mechanism.
10. Mixer.
11. Intermediate frequency unit.
12. Impulse selection.
13. Phase rectifier.
14. Changeover from rear to front receiver.
15. DF / direct current amplifier.
16. Integration motors.

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